Lesson 3

Considerations in Planning Public Health Surveillance

Instructor's Guide Form

Lesson Title: Considerations in planning public health surveillance

Lesson Goal: For each student to understand the steps needed to plan a surveillance system

Learning Objectives: By the end of this lesson, the learner will be able to :

1) describe the steps in planning public health surveillance;

2) describe the rationale for each planning step; and

3) describe the activity involved in each planning step.

Equipment and materials needed:

- Overhead projector
- Transparencies #3.1 - #3.24
- CDC- Case definitions for Public Health Surveillance - *included*

Time Required: 75 minutes

Synopsis of Lesson: This lesson provides a foundation for future lessons. The steps involved in the planning process will be briefly described. Steps will be discussed in detail in future lessons.

Adult Education Application: Instead of listing the steps for planning surveillance, you can ask the students to develop their own individual lists first. After each student has completed a list, you can ask for volunteers to review his/her steps in planning surveillance. He or she could be asked to write the steps in planning surveillance on an overhead slide. Then engage the students in modifying this list in a way that accounts for the eight steps being identified in the correct order.

Lesson 3

Considerations in Planning Public Health Surveillance

Topical Outline

I. Introduction to planning
- A. Review of surveillance
- B. Rationale for planning surveillance
- C. Steps in planning

II. Establishing objectives
- A. Establishing clear objectives
- B. Variety of objectives
- C. Criteria for determining high-priority events for surveillance

III. Developing case definitions
- A. Elements of a case definition
- B. Factors influencing changes in case definitions

IV. Determining data collection systems
- A. Factors in determining data collection systems
- B. Passive systems
- C. Active systems
- D. Sentinel surveillance
- E. Limited surveillance systems

V. Developing data collection instruments
- A. Standardization
- B. Linking data among systems

VI. Field testing
- A. Purpose
- B. Elements to include in field testing

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Considerations in Planning Public Health Surveillance

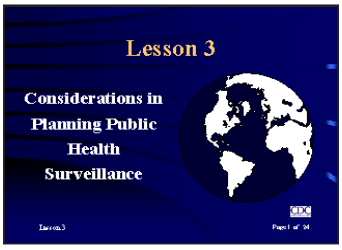
Topical Outline (continued)

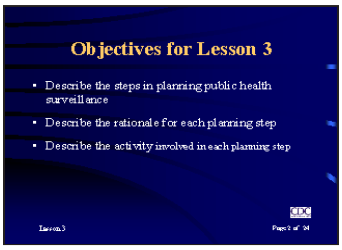
VII. Data Analysis
- A. Considerations for planning analysis
- B. Technological considerations for analysis

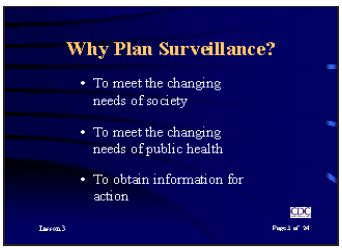
VIII. Interpreting and disseminating information
- A. Purpose
- B. Interpretation
- C. Dissemination

IX. Evaluation of system
- A. Purpose of evaluation
- B. Periodic evaluation assures that the surveillance system remains vibrant.
- C. Evaluation may indicate the need to include new technology in the surveillance system

X. Involvement of others in planning process
- A. Purpose
- B. Groups to involve







Lesson 3

Considerations in Planning Public Health Surveillance

Content Outline

Lesson Objectives

- **Describe the steps in planning public health surveillance**
- **Describe the rationale for each planning step**
- **Describe the activity involved in each planning step**

I. Introduction to planning

A. Review of surveillance

1. public health surveillance is the systematic and ongoing assessment of the health of a community
2. includes timely collection, analysis, interpretation, and dissemination of data
3. surveillance should lead to action

B. Rationale for planning surveillance

1. to meet changing needs of society and the public health community
2. to understand and respond to those needs, an organized approach to planning, developing, implementing, and maintaining surveillance systems is necessary
3. to obtain information for action

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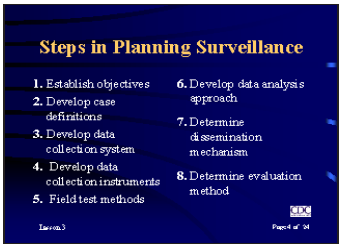

C. Steps in planning

1. establish objectives
2. develop case definitions
3. develop data collection system
4. develop data collection instruments
5. develop and test analytic approach (data analysis)
6. field test methods
7. determine dissemination mechanism and ensure access at different levels
8. determine evaluation method

II. Step 1: Establishing objectives

A. Establishing clear objectives

1. first, critical point in planning a surveillance system
2. at initial stage of planning, you must decide "what do you need to know?"

B. Criteria for determining high-priority events for surveillance

1. quantitative and qualitative approaches
    a. frequency
        1) incidence
        2) prevalence
        3) mortality
        4) years of potential life lost
    b. severity
        1) case-fatality ratio

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2) hospitalization rate
3) disability rate

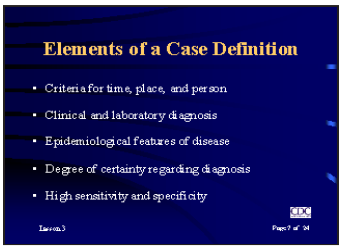
c. direct and indirect costs
d. preventability
e. communicability
f. public interest
g. emerging issue: Year 2000 Health Promotion and Disease Prevention Objectives in U.S. is example of mechanism for identifying high-priority conditions, types of behavior, and interventions that require ongoing monitoring
h. criteria based on consensus process

2. other programmatic considerations
   a. impact
   b. effectiveness
   c. political
   d. evaluate control / prevention measures

C. Augmentation of surveillance data:
additional studies are needed to determine more precisely the causes, natural history, predisposing factors, and modes of transmission associated with the health problem

III. Step 2: Developing case definitions

A. Elements of a clear case definition



1. clinical and laboratory diagnosis (if relevant)

2. criteria for time

3. criteria for place

4. criteria for person

5. epidemiological features of disease

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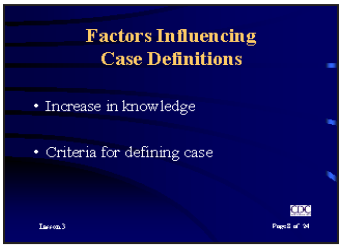


for example- contact with proven case

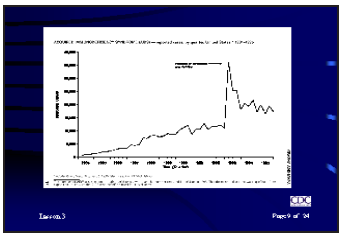
6. potentially categorized by the degree of certainty regarding diagnosis as “confirmed”, "suspect", or "possible"

7. high sensitivity and specificity-may be desired
    a. generally one comes at the expense of the other
    b. must strike a balance between the desire for high sensitivity and the level of effort required to track down false-positive cases

B. Factors influencing changes in case definitions

1. as understanding of a disease and its associated laboratory testing improves, alterations in case definitions often lead to changes in sensitivity and specificity (Legionnaire's Disease, Hantavirus infection)
2. as new surveillance systems complement old ones, reported frequency and patterns of occurrence change

3. different criteria for diagnosis may result in different case definitions
    a. example of ways to determine frequency of diabetes
        1) self-reported surveys
        2) surveys using glucose determination (laboratory-confirmed)
        3) reviews of ambulatory or hospital records (physician-diagnosed)



b. 1993 the case definition of AIDS was modified to include pulmonary tuberculosis, cervical cancer, and CD-4 counts less than 200 cells per mm

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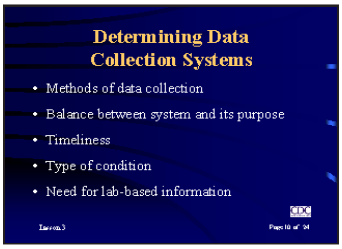

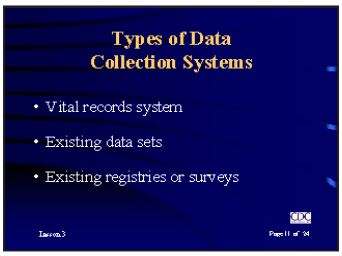

IV. Step 3: Develop data collection systems

A. General factors in determining data collection systems

1. there are many ways to obtain information on disease, injuries, risk factors (e.g., police records, laboratory records, etc.)

2. each mechanism must be balanced against the purpose of that system

3. timeliness is important for frequently fatal conditions
    a. plague
    b. rabies
    c. meningococcal meningitis

4. notifiable-disease systems are most appropriate for potentially catastrophic conditions with high and urgent preventability constraints

5. detailed information on influenza strains or salmonella serotypes must come from laboratory-based systems

6. long-term mortality patterns are available through vital records systems

7. existing data sets can be used to compliment surveillance data
    a. sets include vital records, administrative systems, and risk-factor or health-interview surveys
    b. data sets are not surveillance systems in and of themselves
    c. surveillance is a larger process that requires analysis, interpretation, and distribution of reports

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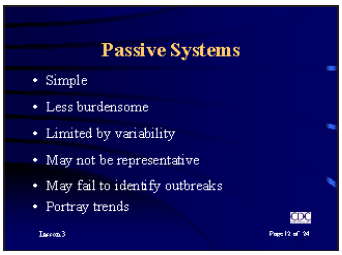
8. existing registries or surveys may collect information on defined populations and can provide valuable data for surveillance purposes
    a. to be useful, information must be collected and reported on a timely basis
    b. population under study must be reasonably representative
    c. however, can be expensive
    d. example - cancer registry



B. Passive data collection systems

1. most routine notifiable-disease surveillance systems are passive

2. health care providers report notifiable diseases, based on a published list of conditions, on a case-by-case basis to the local health department

3. simple and less expensive than active system

4. limited by variability and incompleteness in reporting

5. completeness of reporting may be augmented by efforts to publicize the importance of reporting and by continued feedback to those who collect it.

6. passive systems may not be representative and may fail to identify outbreaks

7. passive systems provide data that portrays trends

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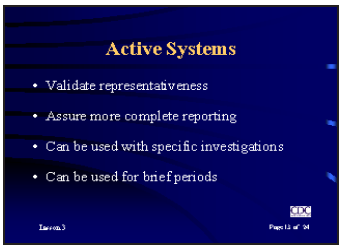

C. Active data collection systems

1. used for conditions of particular importance
2. regular outreach to potential reporters to stimulate the reporting of specific diseases or injuries
3. can validate the representativeness of passive reports
4. can assure more complete reporting of conditions
5. can be used with specific epidemiologic investigations
6. more expensive than passive system
7. due to limited resources, active systems are often used for brief period for discrete purposes (measles elimination efforts, TB, AIDS)

D. Sentinel surveillance systems

1. selected persons report the event(s) at regular intervals
2. may be active or passive
3. discussed in next lesson

E. Limited surveillance systems

1. refer to time or reporter
2. if time is limited,
   a. conducted to resolve specific problems and then terminate
   b. used to deal with specific problems for which all cases must be identified in order to assess level of risk

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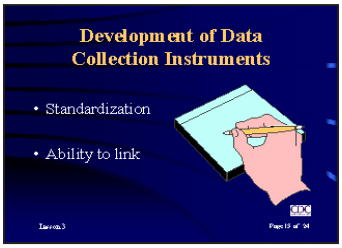


3. limited for reporters, selected for logistic or economic reasons when it is not feasible to mount a full surveillance system across large geographic areas and data are collected to be representative or show trends

V. Step 4: Developing data collection instruments

A. Standardization

1. data collection instruments should use generally recognized computerized formats for each data element
2. instrument should facilitate analysis and comparison with data collected in other systems
    a. census
    b. other surveillance data

B. Ability to link

1. can enhance value of system

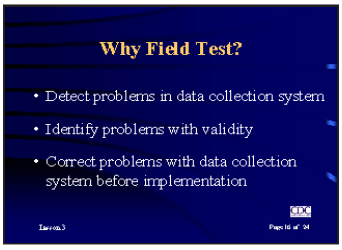
2. additional assurances of confidentiality and privacy consideration are required

3. National Death Index is an example where linkage may be important

C. Limit data to only those data needed at a given level

VI. Step 5: Field testing

A. Purpose of field testing



1. facilitate implementation of feasible systems

2. avoid making changes after systems are implemented on a broad scale

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3. can increase chance of using system for same or other conditions

4. demonstrate how readily the information can be obtained and transferred

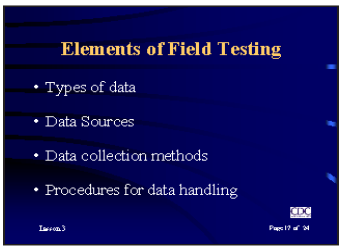
5. detect difficulties in data collection and flow procedures

6. detect difficulties in content of specific questions

7. identify problems with the information collected

8. facilitate examination and comparison of a variety of approaches that would not be feasible on a large scale

9. identify methods suitable for other conditions or settings



B. Elements to include in field testing

1. types of data to be collected in a surveillance system

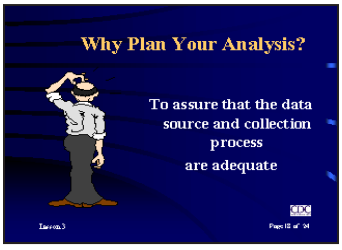
2. data sources

3. data collection methods

4. procedures for handling the information

VII. Step 6: Data analysis

A. Considerations for planning analysis



1. intended/anticipated uses of information

2. data obtained must be assessed to assure that data source and collection process are adequate

3. analyses may be simple, such as the review of all cases of a rare but potentially devastating illness such as plague

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4. other analyses may be more complex
    a. most include assessment of crude number of cases followed by a description of
        1) time (period over which condition occurs)
        2) place (where condition occurs)
        3) person (population in which condition occurs)
    b. requires decisions as to kind of information that needs to be collected
    c. level of detail required varies substantially dependent on nature and complexity of the intervention
    d. how one collects data on geographic areas may depend on whether data examined and used at county, state, and census-tract level

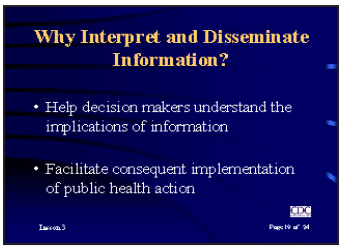
B. Technological considerations for analysis

1. the types of analyses,reporting formats, and size of data bases determine the hardware and software to be used

2. analyses can be designed early in development of system
    a. incorporated into an automated system
    b. run by support personnel

VIII. Step 7: Interpreting and disseminating information

A. Purpose



1. to enable decision makers at all levels to see and understand implications of information

2. to make decisions on appropriate public health interventions

3. to facilitate consequent implementation of public health action

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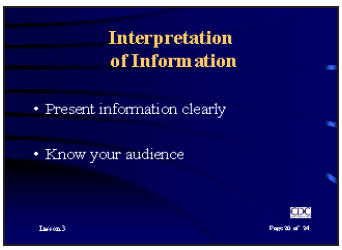


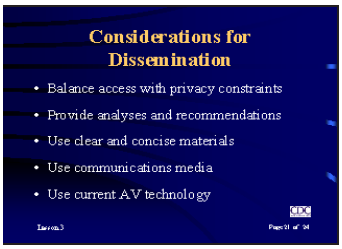
4. to enable decision makers to evaluate effectiveness and benefits of public health actions

B. Interpretation

1. must be presented in a compelling manner to facilitate use of information

2. need to put data into context
    a. trends over time
    b. comparison with complementary sources of data

3. need to know characteristics of audiences who will use the information



C. Dissemination

1. routine, public access to data should be planned
    a. consistent with privacy constraints
    b. facilitated with range of electronic media

2. dissemination of analyses and interpretation of surveillance results with recommendations tailored to decision makers and different target audiences

3. use clear, concise tables, graphs, and maps so nontechnical persons can understand the data

4. use communications media to amplify messages from surveillance information to a broader population

5. use current audiovisual technology

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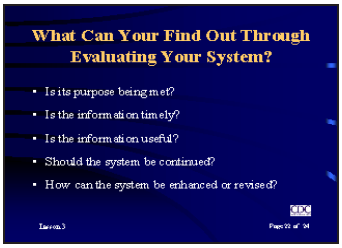

IX. Assuring use of analysis and interpretation through evaluation

A. Purpose of evaluation

1. determine whether purposes of surveillance system have been met
2. determine whether system generated data needed to provide answers to problems
3. determine if information was timely
4. determine usefulness for researchers, public health professionals
5. determine if development of system was worth effort
6. determine if participants wish to continue
7. determine ways to enhance attributes of system (which will be discussed in Lesson 9)
    a. timeliness
    b. simplicity
    c. flexibility
    d. acceptability
    e. sensitivity
    f. predictive value positive
    g. representativeness
    h. cost-effectiveness

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B. Periodic evaluation assures that the surveillance system remains vibrant.

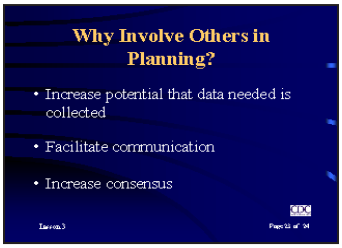
C. Evaluation may indicate the need to include new technology in the surveillance system

1. use of electronic medical records
2. more timely collection of data

X. Involvement of others in planning process

A. Purpose

1. strengthen the potential that data needed will be collected
2. facilitate communication
3. facilitate consensus regarding priorities and methods consistent with needs and resources of those involved



B. Groups to involve

1. anticipated users such as customers and clients of the system
2. clinicians
3. policy makers
4. hospitals
5. volunteer agencies
6. professional groups

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7. laboratories

8. state and local health departments

9. program managers

10. public/community groups

11. administrative groups (e.g., HCFA)

12. justice departments or other interest groups (e.g., injury, violence)

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